IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln. No:	10/527,634
Applicants:	Martyn Vincent Twigg et al.
Filed:	October 7, 2005
Title:	COMPRESSION IGNITION ENGINE AND EXHAUST SYSTEM THEREFOR
TC/A.U.:	3748
Examiner:	Tu Minh Nguyen
Confirmation No.:	2199
Docket No.:	JMYT-347US

DECLARATION UNDER 37 C.F.R. §1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Raymond J. Conway, hereby declare that:

1. I received a Bachelor of Science degree in Mechanical Engineering from Villanova University, Villanova, PA in 1986. I have over ten years of work experience in the area of the treatment of exhaust gas emissions from compression ignition engines, specifically diesel engines. I am currently Retrofit Systems Development Manager for Johnson Matthey Inc.

2. I have reviewed the claims and the specification of the present application. Based on this review, I believe that I have an understanding of the invention recited in the claims of the present application.

3. It is my understanding that the present application, as recited for example in claim 1, involves a system comprising a compression ignition engine configured to operate in a first, normal running mode to produce exhaust gas, and in a second mode, wherein when operating in the second mode the engine produces an exhaust gas comprising an increased level of carbon monoxide (CO) relative to the exhaust gas produced in the first mode. The system further includes means to switch engine operation between the two modes in response to at least one of exhaust gas temperature, catalyst bed temperature or, if a filter is present, a

need to regenerate the filter. The system also includes an exhaust system disposed downstream of the compression ignition engine for receiving the exhaust gas therefrom, the exhaust system comprising a catalysed component comprising a flow through, non-filtered substrate monolith comprising a palladium (Pd) catalyst supported on a first support material associated with at least one base metal promoter and a platinum (Pt) catalyst associated with the supported Pd catalyst, wherein the catalysed component is an oxidation catalyst or a NO oxidation catalyst, and wherein when the catalysed component is the NO oxidation catalyst, a filter is located downstream of the catalysed component.

4. I have also reviewed the Office Action, dated December 11, 2007, in which the Office has rejected claims 1, 13-21, 25, 34, 36-38, 40, 41 and 43-47 as unpatentable over U.S. Patent No. 6,912,847 ("Deeba") and claims 2, 32, 30, 31 and 33 as unpatentable over Deeba as applied to claims 1 and 36, respectively, in view of legal precedent.

5. I understand that the Office asserts, at pages 3 and 4, that "[i]t is well known to those with ordinary skill in the art that in a typical diesel engine such as the one in Deeba, an engine air-fuel ratio during a high engine load condition is at a lower value than that during a low engine load condition, wherein the lower value air-fuel ratio indicates a larger fuel amount relative to an air amount. Because of this, a CO level for a diesel engine during a high engine load is larger than a CO level during a low engine load. Thus, such disclosure by Deeba is notoriously well known in the art so as to be proper for official notice."

6. I am familiar with diesel engine technology, and in particular such diesel engines as the one described in Deeba, and the operating modes of such engines. I am also familiar with the concept of "air-fuel ratio" and how it applies to such diesel engines.

7. I am also familiar with the enclosed graphs (attachments A and B) produced at another Johnson Matthey test site, in which Figure 1 illustrates the base emissions of CO, i.e. content of CO directly from the engine ("CO emissions"), in the exhaust gas of a diesel engine mounted on a test bed as the torque increases at various engine speeds. Figure 2 shows the same data for a different engine.

8. As shown in Figures 1 and 2, the CO emissions initially decrease as the torque, or engine load, increases. In Figures 1 and 2, speed is held constant for each line of data points; thus, the only way to increase torque (Nm), or engine load, is to reduce the air-fuel ratio, i.e. introduce more fuel into the engine. In other words, for most of the graphs shown in Figures 1 and 2, the CO emissions decrease despite a decreasing air-fuel ratio and increasing torque.

9. It is my understanding that combustion efficiency (i.e., the relative amount of conversion of carbon from the hydrocarbon fuel into carbon dioxide, compared to partially combusted species) of typical diesel engines increases as the combustion temperature increases. This improved combustion efficiency accounts for the decrease of CO emissions as shown in Figures 1 and 2.

10. As a result, the combustion efficiency is high during operation of a combustion engine at the most frequently used intermediate loads where combustion temperatures, and hence exhaust gas temperatures, are higher than at a low load condition, for example at idle, where combustion temperature is lower. Thus, the CO emissions decrease with increasing load, as shown in Figures 1 and 2.

11. At very high loads, as shown in Figures 1 and 2, as combustion efficiency becomes limited by factors such as the mixing of fuel and air, the CO emissions can increase rapidly at maximum peak load for the engine. Such maximum peak load conditions, in which the CO emissions are higher at a higher load than at a lower load, are atypical of the normal operation of typical diesel engines, such as the one in Deeba. Rather, the data suggests that the CO emissions only begin to increase at or very close to the extreme operating condition of maximum peak load of the diesel engine.

12. It is also my opinion, however, that the conclusion, "[b]ecause of this, a CO level for a diesel engine during a high engine load is larger than a CO level during a low engine load. Thus, such disclosure by Deeba is notoriously well known in the art so as to be proper for official notice" is not correct.

13. It is my opinion that the general shape of the Base Emissions of CO versus Torque Figures are typical regardless of the engine speed. Therefore, one of ordinary skill in

the art would not have expected that CO emissions increase across the entire data range of torques. It cannot be inferred that for a typical diesel engine, such as the one disclosed in Deeba, is operating over a torque range at which an incremental increase in torque would cause an increase in CO emissions.

14. In view of my understanding of the above, it is my opinion that the Office has made incorrect assertions regarding the alleged two modes of Deeba and that the Office's position that Deeba discloses "a CO level for a diesel engine during a high engine load is larger than a CO level during a low engine load" is not an accurate statement. Rather, data suggests that such a statement is counter to the normal operation of typical diesel engines except under operation of the diesel engine at or near the extreme condition of maximum peak load. At less than at or close to the maximum peak load in the normal operating range, the statement is not true. In fact, its converse is true.

15. By my signature below, I hereby declare that all statements made in this document of my own knowledge are true, and that all statements made on information and belief are believed to be true. Further, I hereby declare that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing on the application.

Respectfully submitted,

Dated: 11 June 2008

Raymond J. Conway

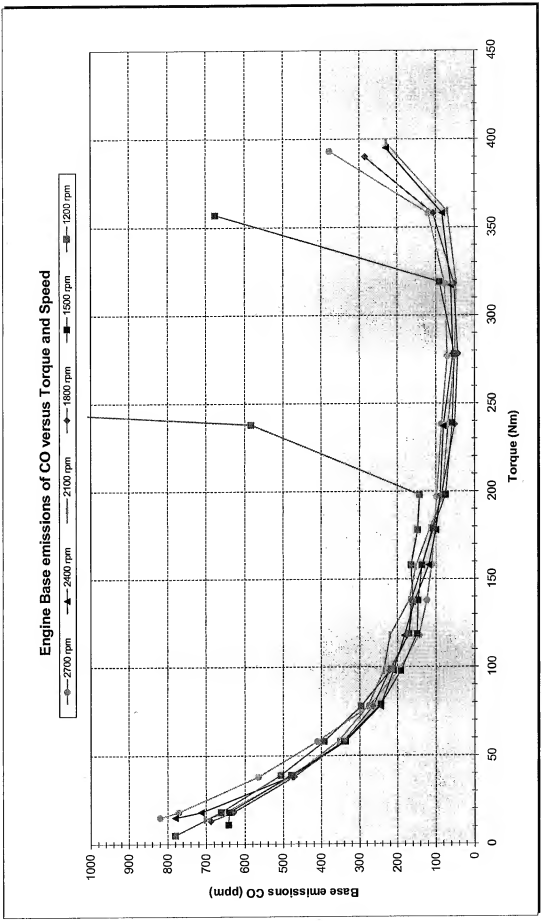

Fig. 1

ATTACHMENT A

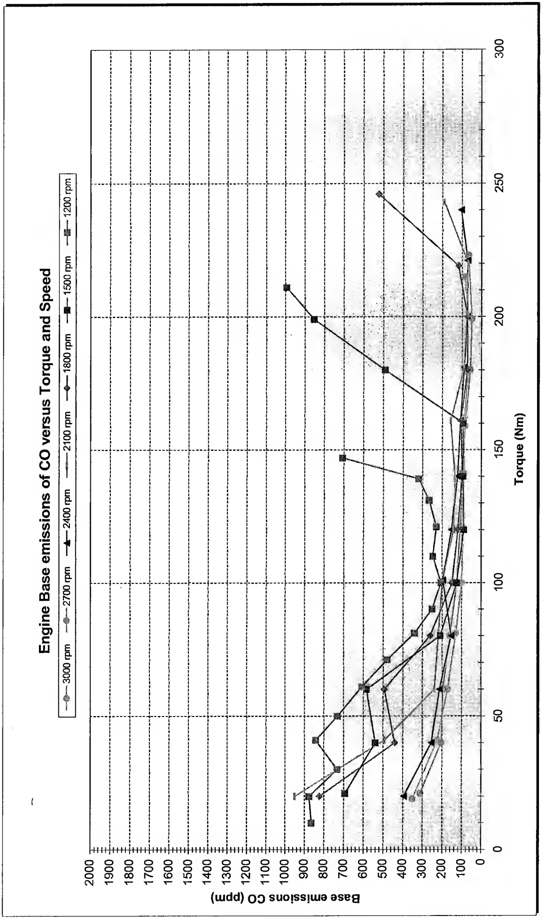

Fig. 2

ATTACHMENT B